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Cheng et al.

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(54) **INTELLIGENT DOOR LOCK SYSTEM WITH A HAPTIC DEVICE**

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(58) **Field of Classification Search**
None

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,680,177	A	6/1954	Rosenthal	
3,898,976	A *	8/1975	Coffman, Jr.	F24F 6/12 126/113
5,306,407	A	4/1994	Hauzer et al.	
5,407,035	A	4/1995	Cole et al.	
5,594,430	A	1/1997	Cutter et al.	
5,695,048	A	12/1997	Tseng	
6,196,936	B1	3/2001	Meckel	
6,323,846	B1	11/2001	Westerman et al.	
6,418,764	B1 *	7/2002	Lerchner	E05B 47/0012 70/279.1

(Continued)

FOREIGN PATENT DOCUMENTS

CA	2676196	A1	7/2008
CA	2834964		8/2012

(Continued)

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(57) **ABSTRACT**

An intelligent door lock system includes a position sensing device configured to be coupled to a drive shaft of a lock device. The position sensing device senses position of the drive shaft to assist in locking and unlocking a lock of a lock device. A circuit is coupled to an engine with a memory. A haptic device is coupled to the circuit. The haptic device provides a visual indication that the lock has reached a final position. A device converts energy into mechanical energy and is coupled to the drive shaft. The positioning sensing device, the circuit, the position sensing device and the device that converts energy operate to rotate the drive shaft to lock and unlock the lock device.

26 Claims, 40 Drawing Sheets

